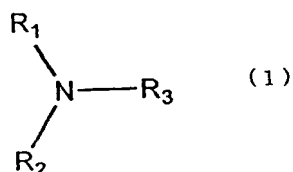


WHAT IS CLAIMED IS:

1. A catalyst for producing a rigid polyurethane foam by means of at least one blowing agent selected from the group consisting of 1,1,1,3,3-pentafluoropropane (HFC-  
5 245fa), 1,1,1,3,3-pentafluorobutane (HFC-365mfc) and a low boiling point hydrocarbon, which comprises:

(A) an amine compound of the following formula (1):



wherein each of  $R_1$ ,  $R_2$  and  $R_3$  which are independent of one  
10 another, is a  $C_{1-20}$  alkyl group, and at least one amine compound selected from the group consisting of triethylenediamine, N,N,N',N'-tetramethyl-1,6-hexanediamine and N,N-dimethylcyclohexylamine; or

(B) an amine compound having an alkyl ether group  
15 and/or an aryl ether group in its molecule.

2. The catalyst for producing a rigid polyurethane foam according to Claim 1, wherein in the formula (1), each of  $R_1$ ,  $R_2$  and  $R_3$  which are independent of one another, is a methyl group, an ethyl group, a propyl group, a butyl  
20 group, a pentyl group, a hexyl group, a heptyl group, an octyl group, a nonyl group, a decyl group, an undecyl group, a dodecyl group, a tridecyl group, a tetradecyl group, a heptadecyl group or a hexadecyl group.

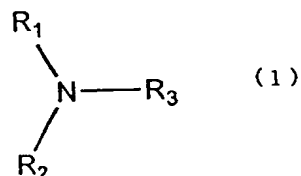
3. The catalyst for producing a rigid polyurethane foam

according to Claim 1, wherein the amine compound of the formula (1) is at least one amine compound selected from the group consisting of trimethylamine, dimethylethylamine, dimethylpropylamine, dimethylbutylamine, dimethylpentylamine, dimethylhexylamine, dimethylheptylamine, dimethyloctylamine, dimethylnonylamine, dimethyldecylamine, dimethylundecylamine, dimethyldodecylamine, dimethyltridecylamine, dimethyltetradecylamine, dimethylpentadecylamine and dimethylhexadecylamine.

4. The catalyst for producing a rigid polyurethane foam according to Claim 1, wherein the composition of the amine compound of the formula (1) and said at least one amine compound selected from the group consisting of triethylenediamine, N,N,N',N'-tetramethyl-1,6-hexanediamine and N,N-dimethylcyclohexylamine, comprises from 10 to 95 wt% of the amine compound of the formula (1) and from 90 to 5 wt% of said at least one amine compound selected from the group consisting of triethylenediamine, N,N,N',N'-tetramethyl-1,6-hexanediamine and N,N-dimethylcyclohexylamine.

5. A catalyst for producing a rigid polyisocyanurate foam by means of at least one blowing agent selected from the group consisting of 1,1,1,3,3-pentafluoropropane (HFC-245fa), 1,1,1,3,3-pentafluorobutane (HFC-365mfc) and a low boiling point hydrocarbon, which comprises an

aliphatic amine compound of the following formula (1):



wherein each of  $R_1$ ,  $R_2$  and  $R_3$  which are independent of one another, is a  $C_{1-20}$  alkyl group, and a polyisocyanurate  
5 catalyst.

6. The catalyst for producing a rigid polyisocyanurate foam according to Claim 5, wherein in the formula (1), each of  $R_1$ ,  $R_2$  and  $R_3$  which are independent of one another, is a methyl group, an ethyl group, a propyl group, a  
10 butyl group, a pentyl group, a hexyl group, a heptyl group, an octyl group, a nonyl group, a decyl group, an undecyl group, a dodecyl group, a tridecyl group, a tetradecyl group, a heptadecyl group or a hexadecyl group.

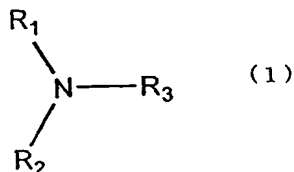
7. The catalyst for producing a rigid polyisocyanurate  
15 foam according to Claim 5, wherein the amine compound of the formula (1) is at least one amine compound selected from the group consisting of dimethylethylamine, dimethylpropylamine, dimethylbutylamine, dimethylpentylamine, dimethylhexylamine,  
20 dimethylheptylamine, dimethyloctylamine, dimethylnonylamine, dimethyldecylamine, dimethylundecylamine, dimethyldodecylamine, dimethyltridecylamine, dimethyltetradecylamine, dimethylpentadecylamine and dimethylhexadecylamine.

8. The catalyst for producing a rigid polyisocyanurate foam according to Claim 5, wherein the polyisocyanurate catalyst is at least one polyisocyanurate catalyst selected from the group consisting of organic metal type catalysts such as alkali metal salts of carboxylic acids, alkaline earth metal salts of carboxylic acids, metal alcoholates, metal phenolates and metal hydroxides, tertiary amines, tertiary phosphines, onium salt compounds of phosphorus and quaternary ammonium salts.

9. The catalyst for producing a rigid polyisocyanurate foam according to Claim 5, wherein the composition of the aliphatic amine compound of the formula (1) and the polyisocyanurate catalyst, comprises from 10 to 90 wt% of the aliphatic amine compound of the formula (1) and from 90 to 10 wt% of the polyisocyanurate catalyst.

10. A process for producing a rigid polyurethane foam, which comprises reacting a polyol with a polyisocyanate in the presence of an amine catalyst and a blowing agent, wherein the amine catalyst is:

(A) a catalyst composition comprising an amine compound of the following formula (1):



wherein each of  $R_1$ ,  $R_2$  and  $R_3$  which are independent of one another, is a  $C_{1-20}$  alkyl group, and at least one compound

selected from the group consisting of triethylenediamine, N,N,N',N'-tetramethyl-1,6-hexanediamine and N,N-dimethylcyclohexylamine; or

(B) a catalyst comprising an amine compound having  
5 an alkyl ether group and/or an aryl ether group in its molecule; and the blowing agent is:

at least one blowing agent selected from the group consisting of 1,1,1,3,3-pentafluoropropane (HFC-245fa), 1,1,1,3,3-pentafluorobutane (HFC-365mfc) and a low  
10 boiling point hydrocarbon.

11. The process for producing a rigid polyurethane foam according to Claim 10, wherein in the formula (1), each of R<sub>1</sub>, R<sub>2</sub> and R<sub>3</sub> which are independent of one another, is a methyl group, an ethyl group, a propyl group, a butyl  
15 group, a pentyl group, a hexyl group, a heptyl group, an octyl group, a nonyl group, a decyl group, an undecyl group, a dodecyl group, a tridecyl group, a tetradecyl group, a heptadecyl group or a hexadecyl group.

12. The process for producing a rigid polyurethane foam  
20 according to Claim 10, wherein the amine compound of the formula (1) is at least one amine compound selected from the group consisting of trimethylamine, dimethylethylamine, dimethylpropylamine, dimethylbutylamine, dimethylpentylamine,  
25 dimethylhexylamine, dimethylheptylamine, dimethyloctylamine, dimethylnonylamine, dimethyldecylamine, dimethylundecylamine,

dimethyldodecylamine, dimethyltridecylamine,  
dimethyltetradecylamine, dimethylpentadecylamine and  
dimethylhexadecylamine.

13. The process for producing a rigid polyurethane foam  
5 according to Claim 10, wherein the composition of the  
amine compound of the formula (1) and said at least one  
amine compound selected from the group consisting of  
triethylenediamine, N,N,N',N'-tetramethyl-1,6-  
hexanediamine and N,N-dimethylcyclohexylamine, comprises  
10 from 10 to 95 wt% of the amine compound of the formula  
(1) and from 90 to 5 wt% of said at least one amine  
compound selected from the group consisting of  
triethylenediamine, N,N,N',N'-tetramethyl-1,6-  
hexanediamine and N,N-dimethylcyclohexylamine.

14. The process for producing a rigid polyurethane foam  
15 according to Claim 10, wherein the low boiling point  
hydrocarbon is a hydrocarbon having a boiling point of  
from -30 to 90°C.

15. The process for producing a rigid polyurethane foam  
20 according to Claim 14, wherein the hydrocarbon having a  
boiling point of from -30 to 90°C, is at least one  
hydrocarbon selected from the group consisting of propane,  
butane, 2-methylpropane, pentane, cyclopentane, 2-  
methylbutane, 2,2-dimethylpropane, cyclopropane, hexane,  
25 2-methylpentane, 3-methylpentane, 2,2-dimethylbutane,  
cyclohexane, 2,4-dimethylpropane, 3,3-dimethylpropane and  
2,2,3-trimethylbutane.

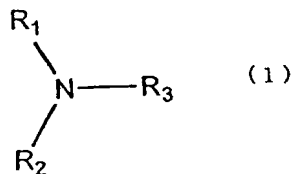
16. The process for producing a rigid polyurethane foam according to Claim 10, wherein the amine catalyst is used in an amount of from 0.01 to 20 parts by weight per 100 parts by weight of the polyol.

5 17. The process for producing a rigid polyurethane foam according to Claim 10, wherein a foam stabilizer is used as an auxiliary agent.

18. The process for producing a rigid polyurethane foam according to Claim 10, wherein a cross-linking agent  
10 and/or a chain extender is used as an auxiliary agent.

19. The process for producing a rigid polyurethane foam according to Claim 10, wherein a flame retardant is used as an auxiliary agent.

20. A process for producing a rigid polyisocyanurate  
15 foam, which comprises reacting a polyol with a polyisocyanate in the presence of a catalyst and a blowing agent, wherein the catalyst is a catalyst composition comprising an aliphatic amine compound of the following formula (1):



20

wherein each of  $R_1$ ,  $R_2$  and  $R_3$  which are independent of one another, is a  $C_{1-20}$  alkyl group, and a polyisocyanurate catalyst, and the blowing agent is at least one blowing agent selected from the group consisting of 1,1,1,3,3-

pentafluoropropane (HFC-245fa), 1,1,1,3,3-pentafluorobutane (HFC-365mfc) and a low boiling point hydrocarbon.

21. The process for producing a rigid polyisocyanurate  
5 foam according to Claim 20, wherein in the formula (1),  
each of  $R_1$ ,  $R_2$  and  $R_3$  which are independent of one another,  
is a methyl group, an ethyl group, a propyl group, a  
butyl group, a pentyl group, a hexyl group, a heptyl  
group, an octyl group, a nonyl group, a decyl group, an  
10 undecyl group, a dodecyl group, a tridecyl group, a  
tetradecyl group, a heptadecyl group or a hexadecyl group.

22. The process for producing a rigid polyisocyanurate  
foam according to Claim 20, wherein the aliphatic amine  
compound of the formula (1) is at least one amine  
15 compound selected from the group consisting of  
dimethylethylamine, dimethylpropylamine,  
dimethylbutylamine, dimethylpentylamine,  
dimethylhexylamine, dimethylheptylamine,  
dimethyloctylamine, dimethylnonylamine,  
20 dimethyldecylamine, dimethylundecylamine,  
dimethyldodecylamine, dimethyltridecylamine,  
dimethyltetradecylamine, dimethylpentadecylamine and  
dimethylhexadecylamine.

23. The process for producing a rigid polyisocyanurate  
25 foam according to Claim 20, wherein the polyisocyanurate  
catalyst is at least one polyisocyanurate catalyst  
selected from the group consisting of organic metal type



catalysts such as alkali metal salts of carboxylic acids, alkaline earth metal salts of carboxylic acids, metal alcoholates, metal phenolates and metal hydroxides, tertiary amines, tertiary phosphines, onium salt

5 compounds of phosphorus and quaternary ammonium salts.

24. The process for producing a rigid polyisocyanurate foam according to Claim 20, wherein the composition of the aliphatic amine compound of the formula (1) and the polyisocyanurate catalyst, comprises from 10 to 90 wt% of  
10 the aliphatic amine compound of the formula (1) and from 90 to 10 wt% of the polyisocyanurate catalyst.

25. The process for producing a rigid polyisocyanurate foam according to Claim 20, wherein the catalyst composition comprising the aliphatic amine of the formula  
15 (1) and the polyisocyanurate catalyst, is used in an amount of from 0.01 to 40 parts by weight per 100 parts by weight of the polyol.

26. The process for producing a rigid polyisocyanurate foam according to Claim 20, wherein a foam stabilizer is  
20 used as an auxiliary agent.

27. The process for producing a rigid polyisocyanurate foam according to Claim 20, wherein a cross-linking agent and/or a chain extender is used as an auxiliary agent.

28. The process for producing a rigid polyisocyanurate  
25 foam according to Claim 20, wherein a flame retardant is used as an auxiliary agent.